SIEMENS

syngo MammoReport

SP

System Manual

Calibration of Monitors (R630)

using SMfit ACT 3.2 or
MediCal Pro 2.3.10 or
CXtra, Cx Edition 4.1.1.001\

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Document revision level

The document corresponds to the version/revision level effective at the time of system delivery. Revisions to hardcopy documentation are not automatically distributed.

Please contact your local Siemens office to order current revision levels.

Disclaimer

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Purpose of document

The purpose of *syngo* MammoReport *Calibration of Monitors* (R630) is to provide instructions on how to install the calibration software SMfit ACT, Medical Pro, or CXtra and perform the calibration of the two high-resolution displays. The quality tests performed regularly by medical physicists/CSE or radiologists/technologists are described in the Quality Control Manual SPB7-420.621.20...

Target group

This manual is intended for customer support engineers.

Training of customer support engineers

The instructions in this guide describe the calibration of

- Siemens TFT monitors
- Barco TFT monitors
- Planar TFT monitors

Due to the technology used in this equipment the setup, service and maintenance is only allowed to be performed by a customer support engineer with proper training in these fields.

Required documents

Siemens TFT Monitors

- Quick Reference Guide, SMfit ACT, Automatic Calibration Tool, Release 3.2 (included in monitor calibration tools, referred to as *Quick Reference Guide*)
- Instruction Manual, SMfit ACT, Automatic Calibration Tool, Release 3.2 (included in monitor calibration tools, referred to as *Instruction Manual*)
- Instruction Manual, Siemens Serial Spotmeter
- Instruction Manual, Universal Serial Luminance Meter

Barco TFT Monitors

- Medical Pro *Installation and User Manual*

Planar TFT Monitors

- CXtra *Installation and User Manual*

Required tools, measurement and auxiliary devices

NOTE	**All tools, measurement and auxiliary devices marked " * " are listed along with their specifications in the STC (Service Tools Catalogue).**

For Siemens TFT Monitors

- SMfit ACT Version 3.2 (contained on *syngo* MammoReport Installation DVD) with Spotmeter, Cable, Foam and Tube
  - Instruction Manual (on Installation DVD)

Optional Tools

- Universal Serial Luminance Meter (order number 8676418)
- Serial interface cable (Null Modem cable #99 00 440)

NOTE	**In Barco and Planar monitors, the sensor for calibration is integrated.**

For Barco TFT Monitors

- MediCal Pro version 2.03.10 (contained on *syngo* MammoReport Installation DVD)
- Installation and User Manual (on Installation CD)
- Original MediCalPro CD (contains the license string)

For Planar TFT Monitors

- CXtra version 4.1.1 (contained on *syngo* MammoReport Installation DVD)
- Installation and User Manual (on Installation CD)

Time required

The calibration of the *syngo* MammoReport workstation requires:

- approx. 1 h for Siemens TFT,
- approx. 0.5 h for Barco TFT,
- approx. 0.25 h for Planar TFT.

Safety information and protective measures

The product-specific safety information contained in this document as well as the general safety information must be observed, see document Safety Information TD00-000.860.01...

NOTICE	**Be aware that this product is intended to be used in a non-patient environment.**

Writing conventions

Text emphasis

⚠WARNING	**WARNING indicates a risk of danger that may lead to death or to serious physical injury.**
⚠CAUTION	**CAUTION used with the safety alert symbol indicates a risk of danger that leads to slight or moderate physical injury and/or damage to property.**
NOTICE	**NOTICE used without the safety alert symbol indicates a risk of danger that if disregarded leads or may lead to potential situations with undesirable results or states other than death, physical injury or damage to property.**
NOTE	**NOTE contains information provided with special emphasis to facilitate proper use of the equipment or proper execution of a procedure, i.e. hints, tips.**

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Prerequisites

NOTE	**Check the label on the backside of the high resolution displays. If more than one workstation is present and the monitors might have been interchanged, choose the two monitors with the smallest difference in X-values and also in Y-values.**

Logging in as OS administrator

1. In the menu bar of the patient browser, click **Options>End Session**.
2. Click **Restart System** button.
3. System shuts down and restarts. Log in as OS administrator (press Shift button while system reboots).

Installing SMfit ACT

The Installation program provides the correct installation under the Windows XP operating system. The SMfit ACT CD contains only one installation program.

For detailed information refer to chapter 4.0 “Installing SMfit ACT” in Instruction Manual of SMfit ACT Automation Calibration Tool, Release 3.2 or higher.

1. Insert the *syngo* MammoReport **Installation DVD for R630 Matrox TFT.**
2. Run **D:\SMfit_Act_V3.2\SMfit_ACT_calibration_V3.2\Program\setup.exe**.

Fig. 1 Enter Password

3. After entering the password and clicking **OK**, the *Welcome* window appears.
4. Click **Next**.
5. The *License Agreement* window appears, click **Yes.**
6. In the *Choose Destination Location* window, click **Next** (default path).
7. In the *Select Components* window, click **Next** (default).
8. In the *Select Program* folder, choose default and click **Next.** This starts the installation and copies the files into the specified folder.
9. In the *Setup Complete* window, click **Finish** to complete Setup. Don’t run SMFit Act

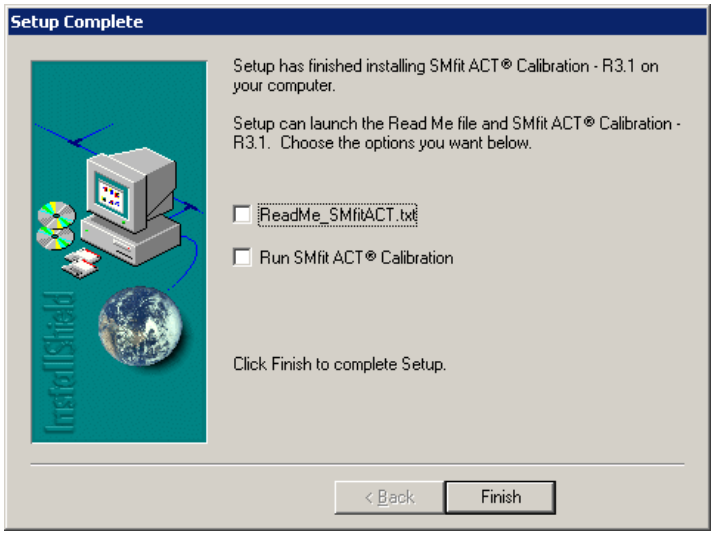

Fig. 2 Setup Complete window

Operating Modes

Launching SMfitACT

1. Reboot the system (without shift key pressed).
2. Login to syngo as user “Administrator”.
3. Right-click on the SMfit ACT tray icon in the Taskbar and choose the function “Start SMfit ACT Calibration”.

NOTE	**If SMfit ACT is started via Start / Programs, a message box with the information that SMfit ACT is already running pops up. Please follow the instructions for a successful program launch.**

Service Level 1 and 2

After installation the program starts automatically, displaying the *Login* window.

NOTE	**The first time SMfit ACT is started, Service Level 2 must be selected for properly establishing preferences.**

1. Select Service Level 2 and enter a valid password. Then press **Enter**.

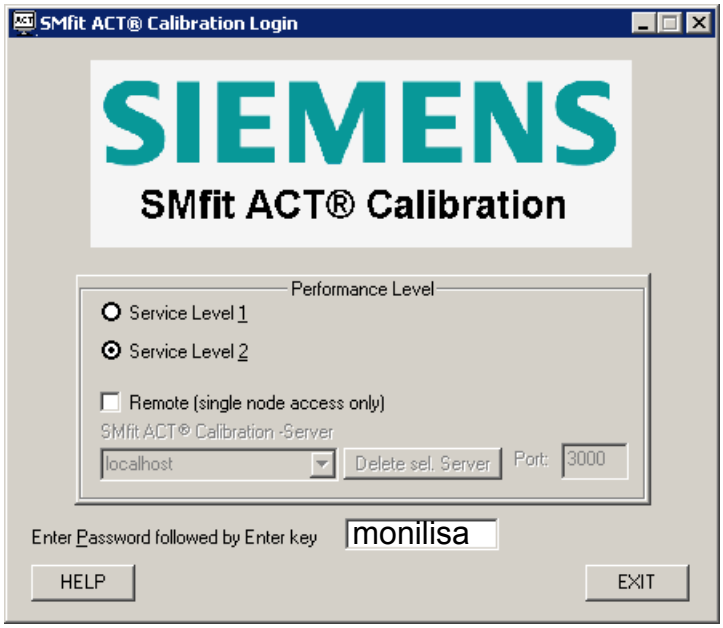

Fig. 3 SMfitACT Login window

After starting SMfit ACT the Performance level has to be selected.

- With Service Level 2, all functions of the program are available.
- The Service Level 1 allows only basic adjustments.
- The Service Level 2 is only for trained service staff and requires a password.

Getting Started

When starting SMfit ACT, the *SMfit ACT Main window* appears. It contains all the available functions once the preference folder is created.

1. To select a menu item, simply click the menu button and a submenu will appear with all the functionality available within this section.

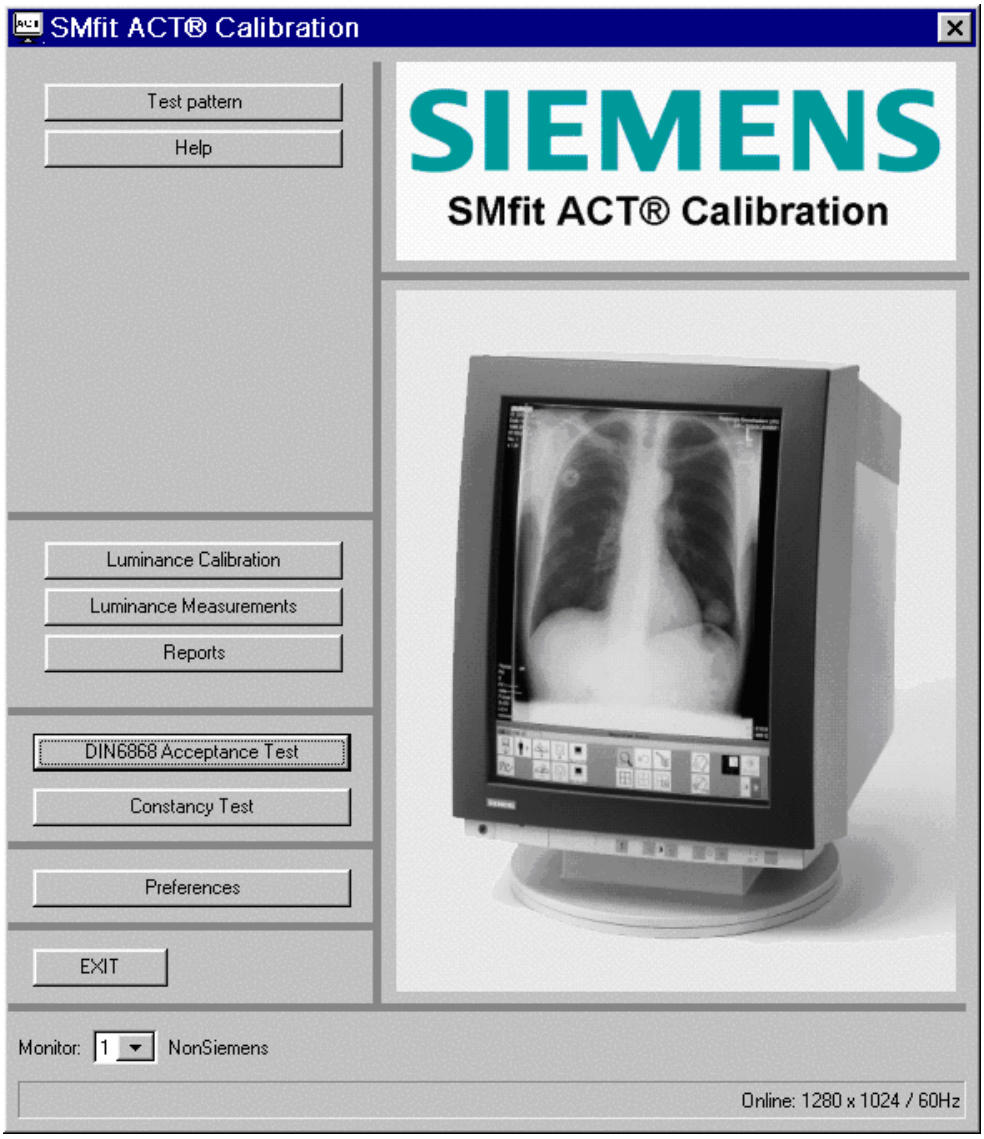

Fig. 4 SMfitACT Main window

2. Click **Preferences** to open the *Preferences* window to select a measurement device.

Preferences Settings

If SMfit ACT is started the first time and/or the monitor settings have changed, the preferences have to be defined.

In the main menu box, through “Preferences”, you have access to the “Preferences” menu and its different tabs.

Measurement Device Menu

1. In the *Preferences* window, click **Measurement Device** menu.
2. In **Measurement Device** menu, select **Device Type**>**Serial Spotmeter** or **Serial Luminance Meter** as type.

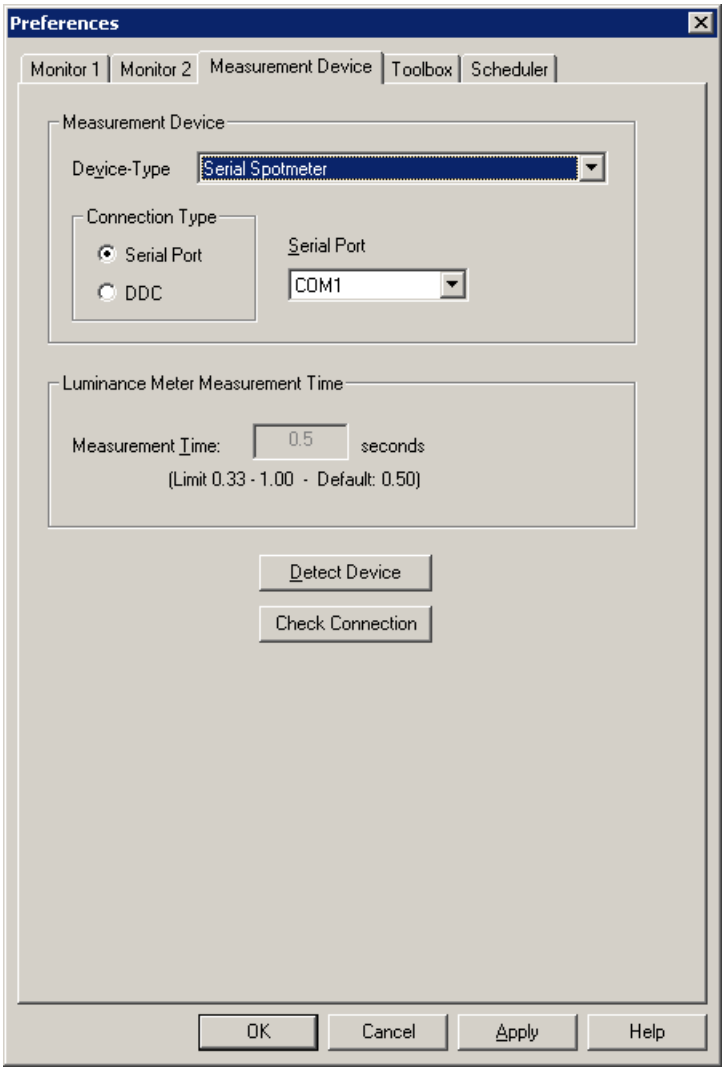

Fig. 5 Selecting Device Type

3. Check that the serial cable is connected.

NOTE **Serial Spotmeter and Universal Serial Luminance Meter can also be connected to the DVI interface (Connection Type “DDC” in Fig. 5).**

4. Then click **Detect Device**.
   The *Autodetection* window appears. Autodetection may take up to 2 minutes if no device is connected.

Fig. 6 Autodetection running

NOTE	**If Autodetection fails, Serial Spotmeter or Universal Serial Luminance Meter must be configured manually.**

Toolbox Menu

In this menu you can perform a profile auto-detection.

1. In the *Preferences* window, click **Toolbox** menu.
2. Create a new profile (e.g. TFTs.dat).
3. Select this profile.
4. Then click **Autodetection**.

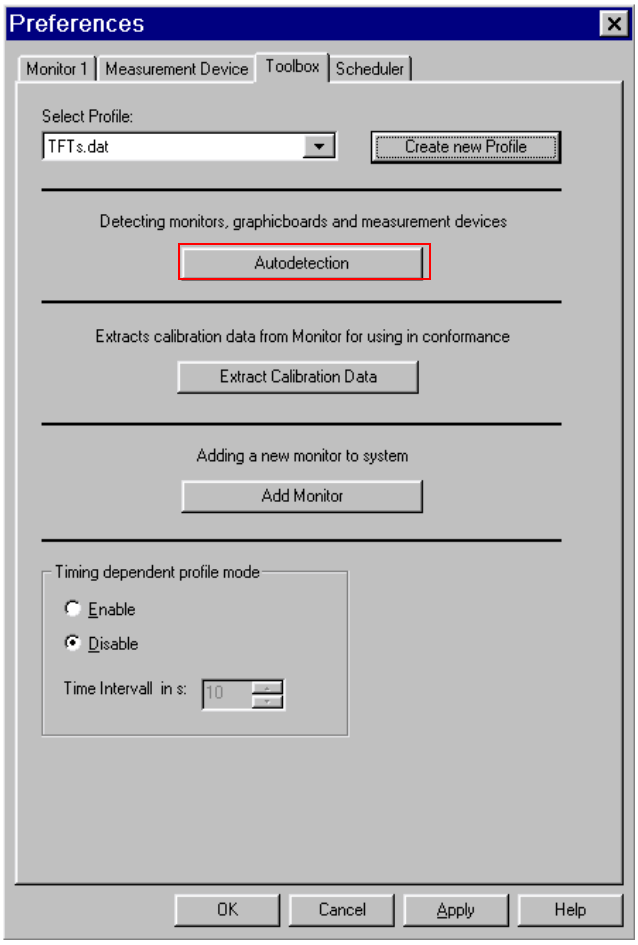

Fig. 7 Select Profile (Screenshot ändern)

5. A new window appears; select monitor types as shown and continue with autodetection. Click **Yes**.

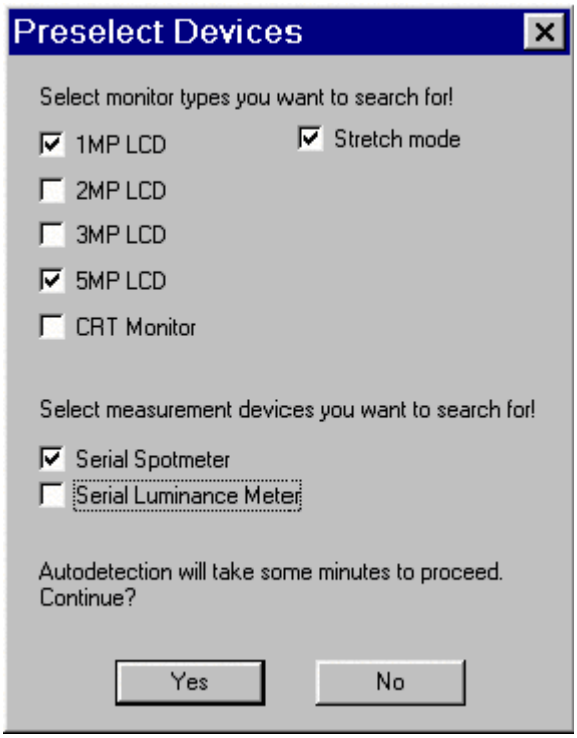

Fig. 8 Autodetection

6. A new message opens.

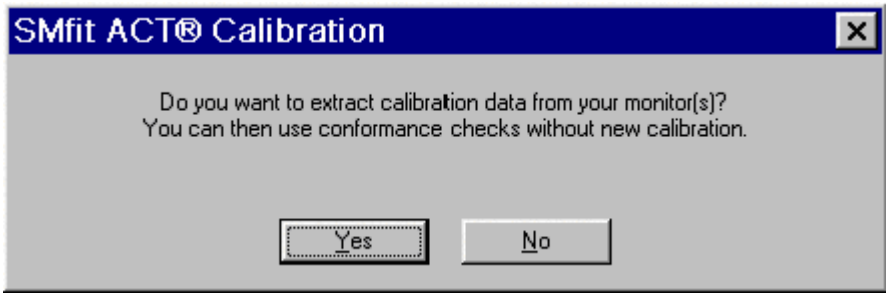

Fig. 9 Extract Message

7. Click **No**.

8. The Preferences Window opens again.
9. Select Tab **Monitor 1** and click **Delete this monitor**.

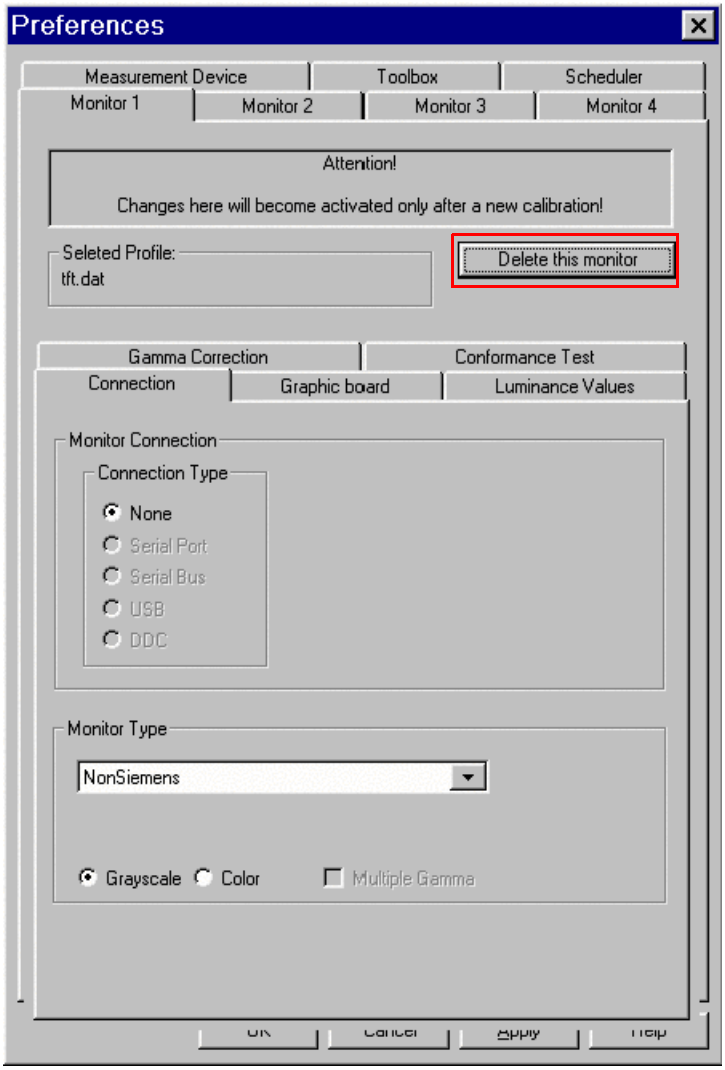

Fig. 10 Preferences of Monitor 1

Checking monitor connections

1. Click **Check Connection** in the tab Monitor 2.

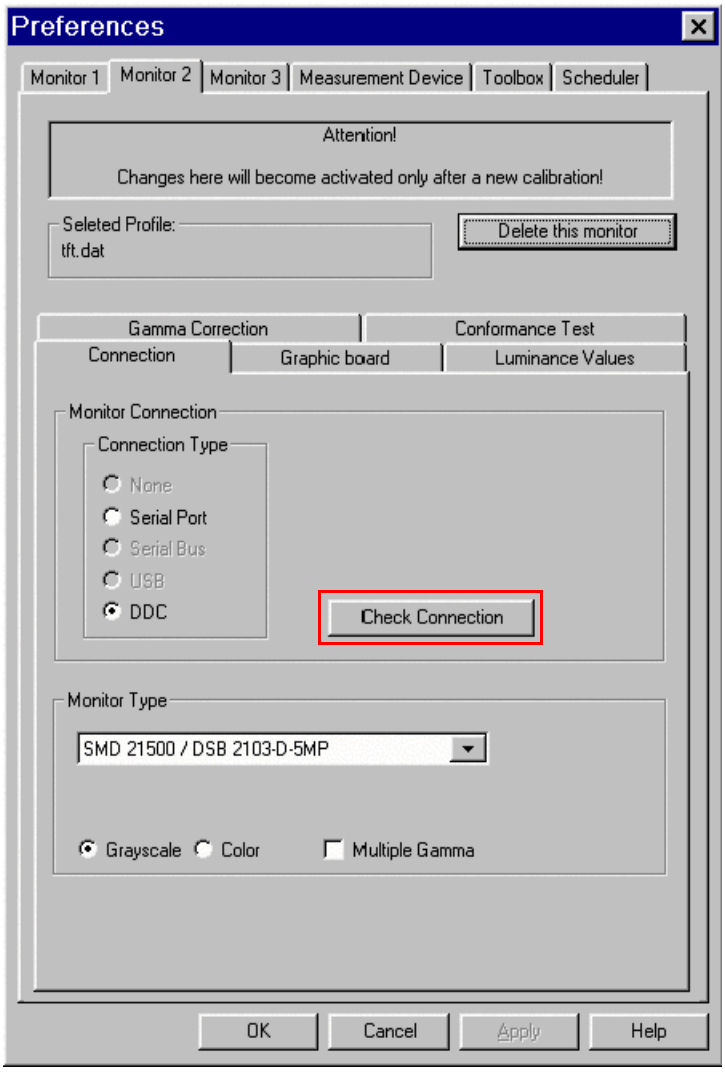

Fig. 11 Preferences of Monitor 2

Fig. 12 Check Connection Message

2. Click **OK**.
3. Repeat last two steps for other TFT monitor.

Selecting Monitors via Preferences

1. Click **Preferences** to open the *Preferences* window to select a monitor. The settings in the **Connection** menu should be as follows:

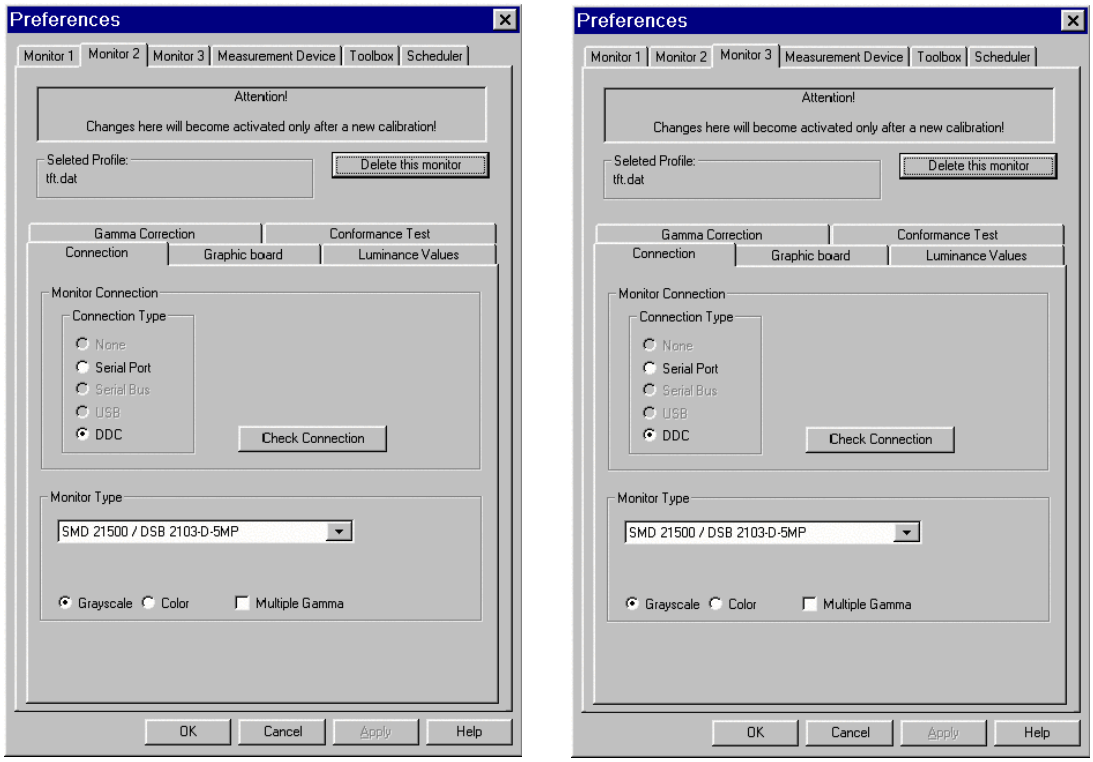

Fig. 13 Preferences: DVI Connection of Monitor 2 (left) and Monitor 3 (right)

2. Click on **Graphic board** to check the window display number settings.

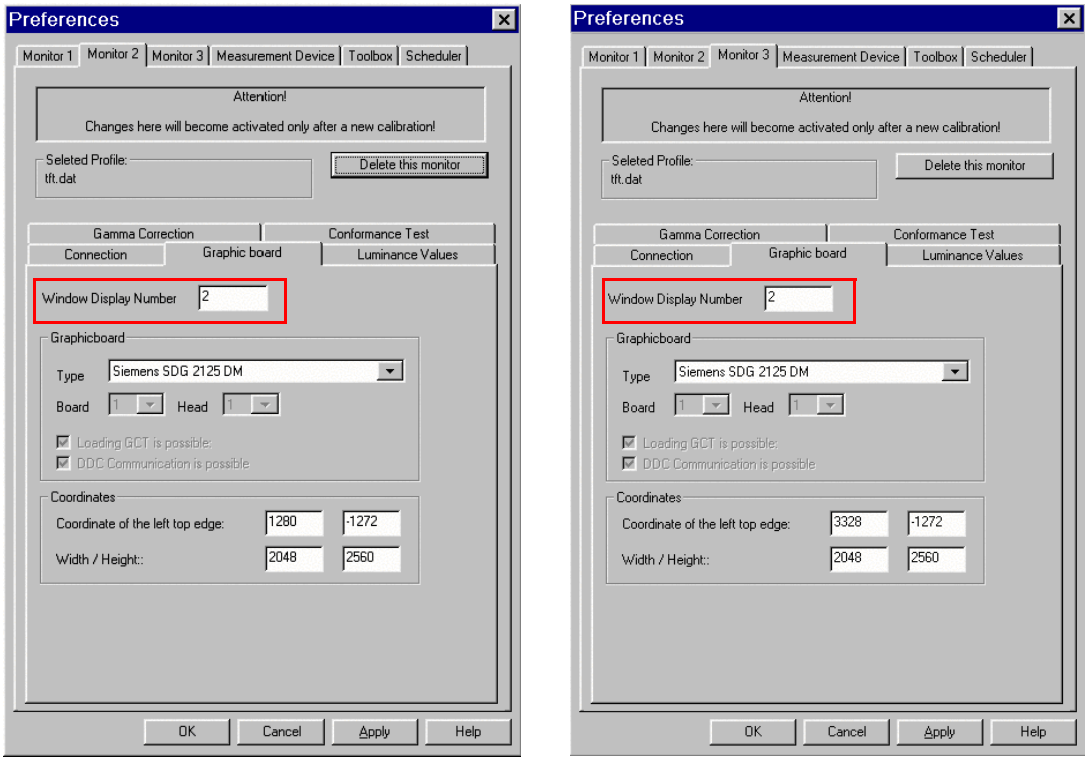

Fig. 14 Check of Window Display Number

Luminance Values

1. Click **Monitor 2** tab.
2. Click **Luminance Values** menu.
3. Set Minimum Luminance to “technical” and change values for Minimum Luminance to 1.0 cd/sqm and Maximum Luminance to 400 cd/sqm.

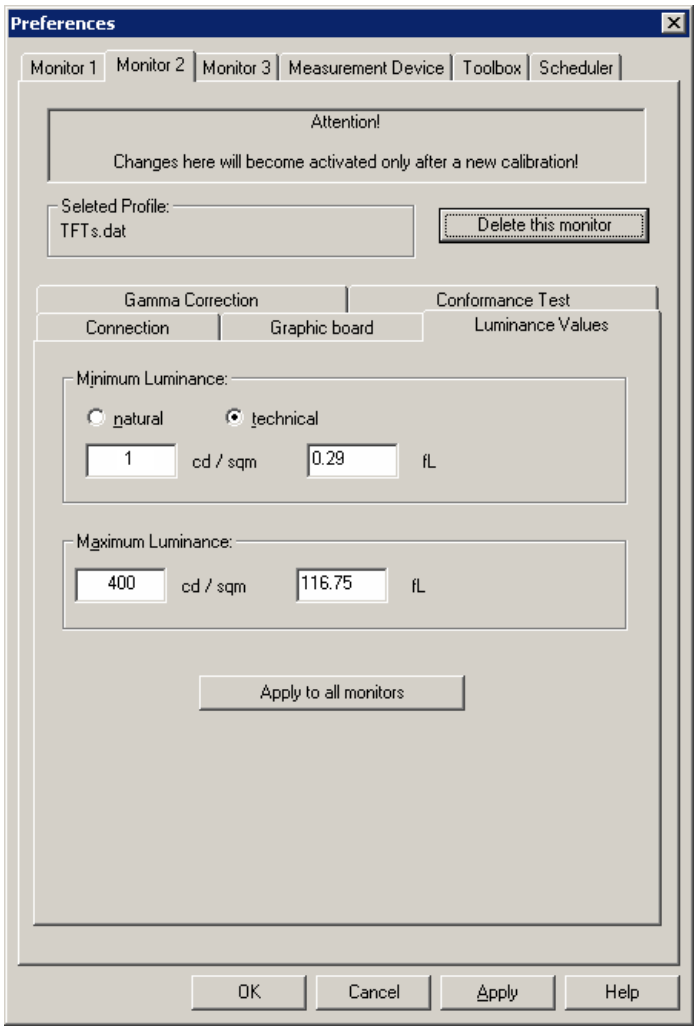

Fig. 15 Preferences of Monitor 2

4. Click **Apply**.
5. Repeat last three steps for Monitor 3.

Conformance Test

With Conformance test, the numbers of base points of the Luminance Measurement for Conformance Test are defined. The default value is 33 points.

1. In the *Preferences* window, click **Monitor 2** menu again.
2. In **Conformance Test** menu select values as follows:

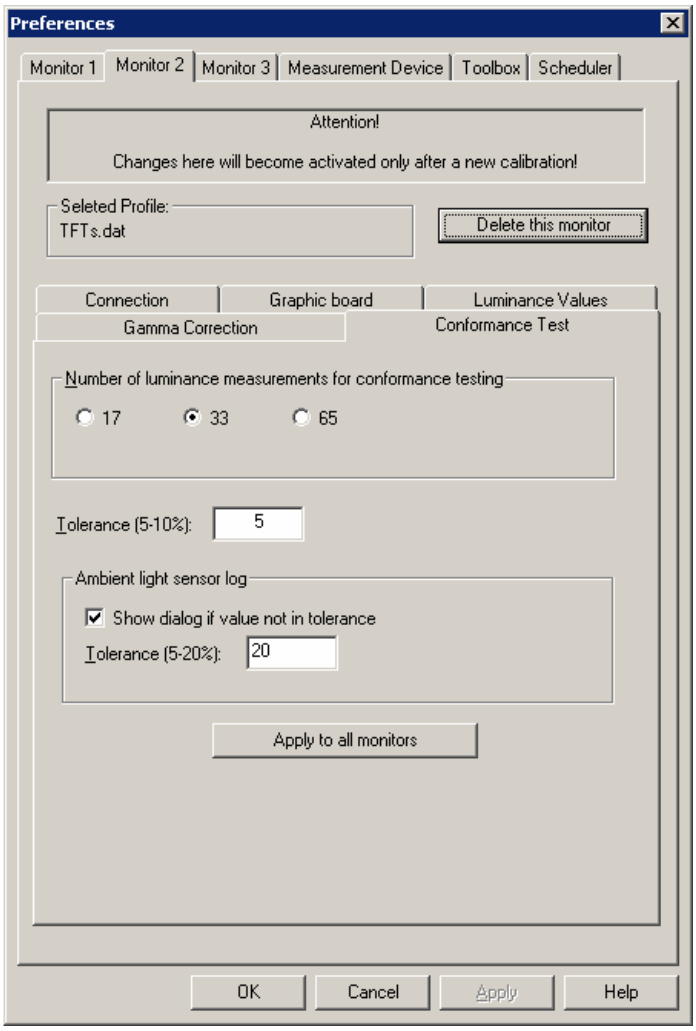

Fig. 16 Preferences of Monitor 2 - Conformance test

3. Click **Apply**.
4. Repeat last two steps for Monitor 3.

Gamma Correction Menu

1. Open the **Gamma Correction** menu.
   This menu displays a list of selectable Gamma Models, e.g:
   - DICOM Part 14 Grayscale Standard Display Function; calculates a gamma correction LUT according to DICOM standards.
2. Set Ambient Light Adjustment Value to 0 cd/sqm.

Recommendation is:
Room with low ambient light below 10 lux

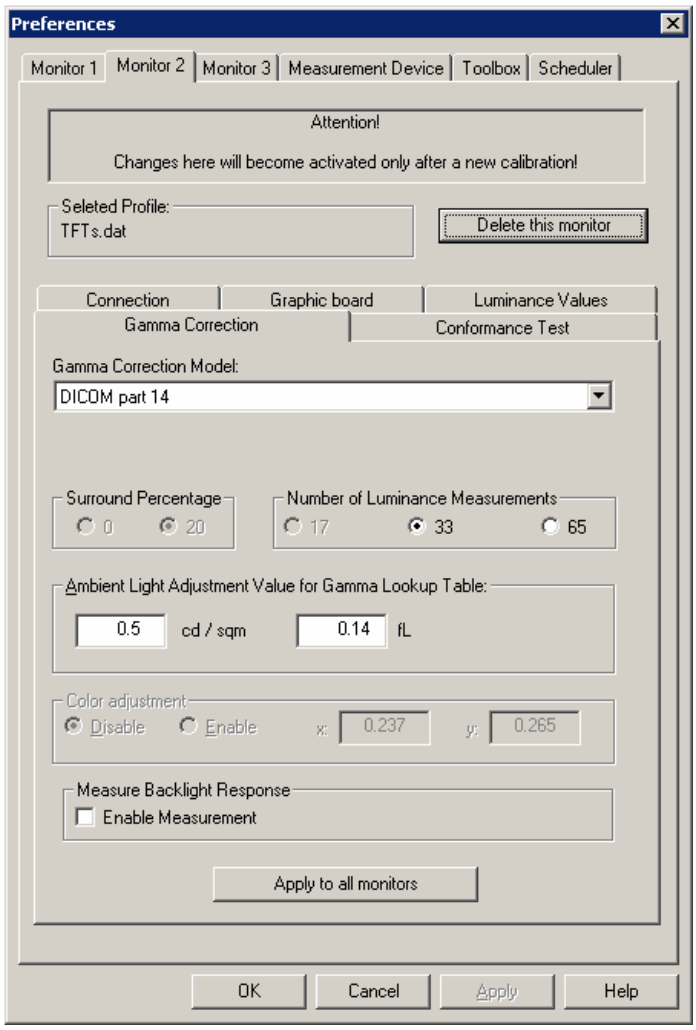

Fig. 17 Gamma Correction parameters

3. Click **Apply**.
4. Repeat last three steps for Monitor 3.
5. Close the window with **OK**.

The monitors delivered with the system always need to be calibrated during start-up at customer site according to the requirements that are described in the Quality Control Manual (Print-No: SPB7-420.621.20...).

⚠CAUTION	**Adjustment / factory setup** **The monitor has been precisely adjusted in the factory using an automatic high performance image processing system. Many of these optimized settings cannot be observed without an appropriate test image and without trained eyes; therefore only modify the settings if required. Particularly, adjustment of the focus is not recommended because it is very subjective, and it is dependent on several other adjustments (brightness/contrast settings, ambient light, etc.).**

Backup of Monitor Settings

1. In the *SMfit ACT Main window,* select **Data** to open the submenu.

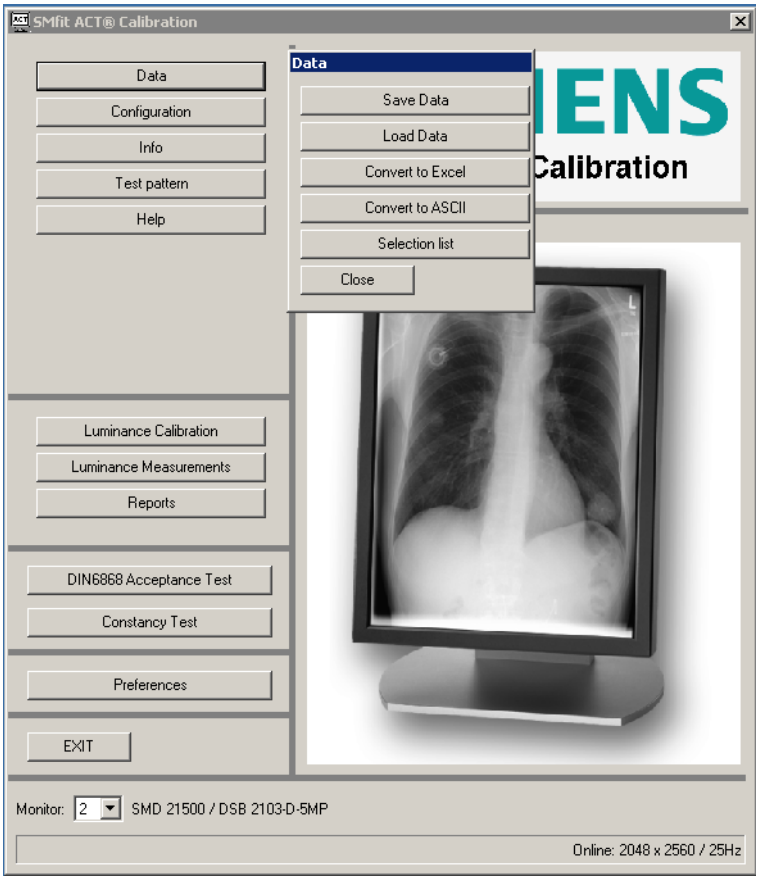

Fig. 1 SMfit ACT Main window - Data submenu

2. Click **Save Data** and select path with specific filename of monitor (e.g.: monitorleft.dat or monitorright.dat).

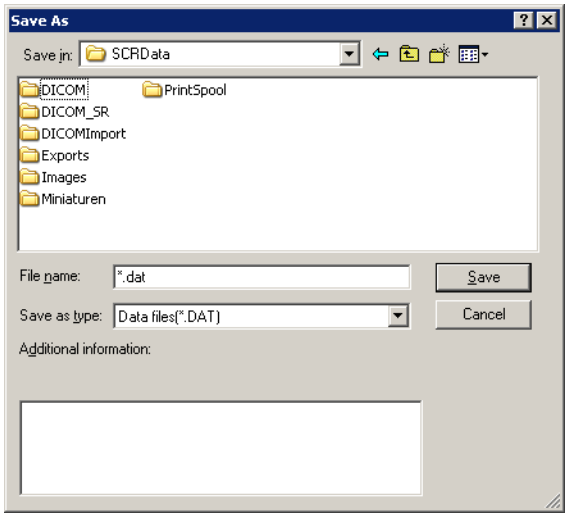

Fig. 2 Save As Dialog

3. Click **Save** and close the window
4. Select other high resolution monitor in Main Window and repeat last two steps.

NOTE	**Not all calibration settings are saved.**

Test Patterns

NOTE	**These defined patterns are independent from the required test images used during the calibration and conformance testing procedures.**

The program includes test images and test patterns to assist in the adjustment and verification of performance.

When a pattern is selected, the menu structure remains in the foreground and the pattern appears in the background.

1. To see the complete pattern, click anywhere on the screen outside the SMfit ACT window.
2. To restore the SMfit ACT window, click anywhere on the screen.
3. In the *SMfit ACT Main window,* select **Test Pattern** to open the submenu. Here you can load a test pattern.
4. Click **Show on all monitors.**
5. Select test pattern as needed.

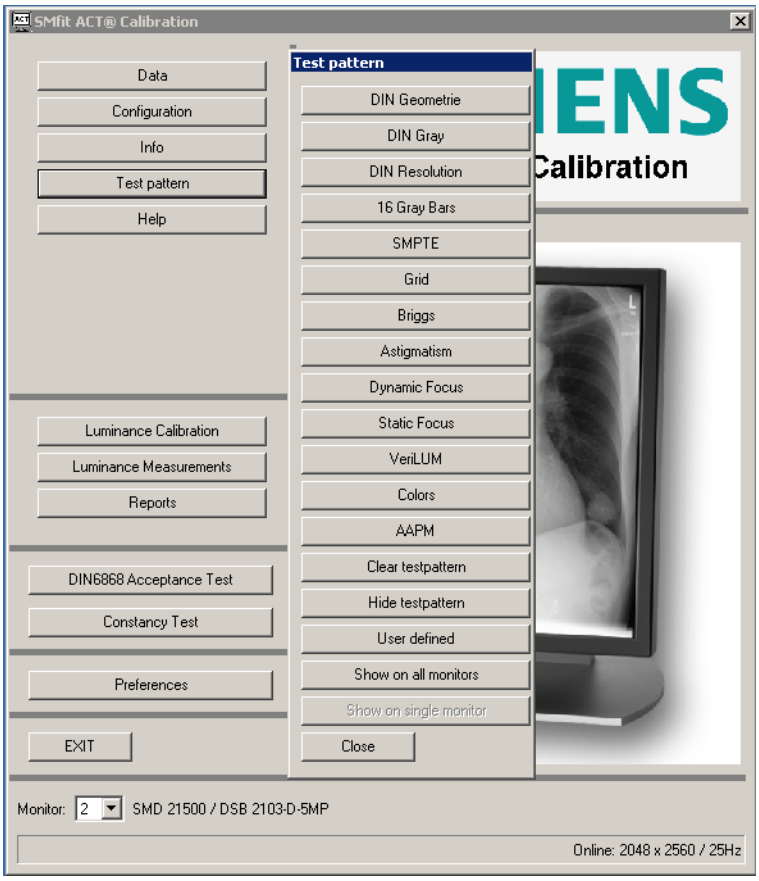

Fig. 3 SMfit ACT Main window - Test Pattern submenu

Luminance Calibration

1. In the *SMfit ACT Main window,* select Monitor 2. Then click **Luminance Calibration** to open the submenu.

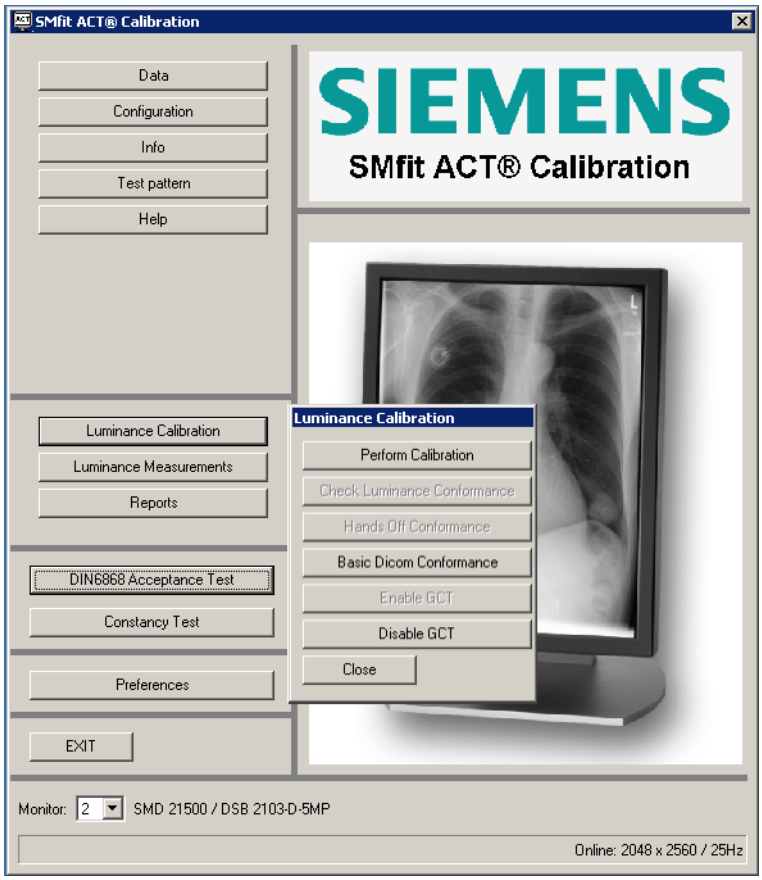

Fig. 4 SMfit ACT Main window: Luminance Calibration submenu

2. Check that GCT is active (the “Enable GCT” button must be deactivated).
3. Click **Perform Calibration.**
4. The *Start Calibration* window appears.

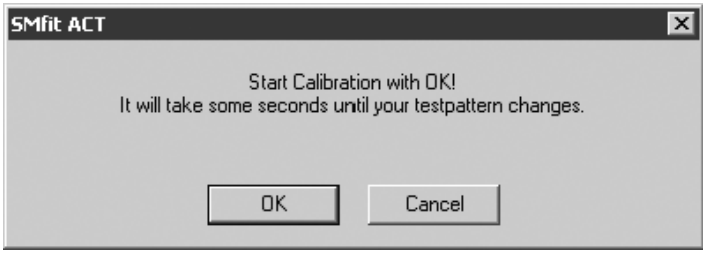

Fig. 5 Start Calibration window

5. Start Calibration with **OK**.

6. If you are calibrating with a Universal Serial Luminance Meter, the following message appears (otherwise continue with step 9.).

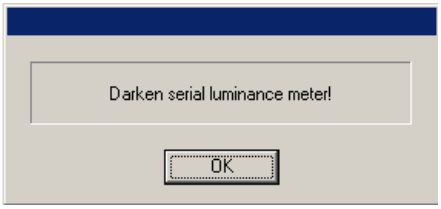

Fig. 6 Message: Darken serial luminance meter

7. Hold the Universal Luminance Meter towards a dark surface (e.g. desk surface).
8. Wait 10 -15 seconds until “Finished” message is displayed, then click “OK”.

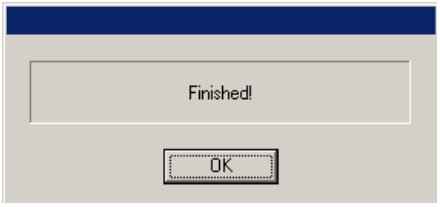

Fig. 7 Message: Finished

9. The *Desired Luminance Values* window displays.

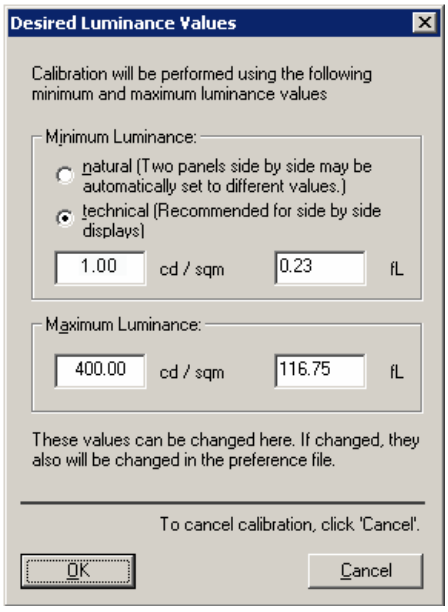

Fig. 8 Desired Luminance Values window

10. Confirm with OK to continue the procedure.

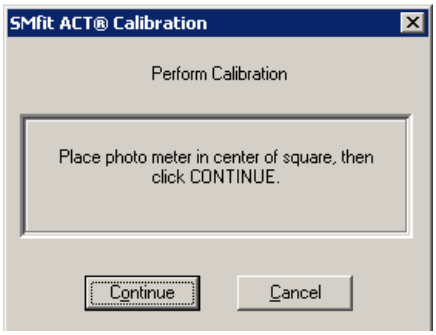

Fig. 9 Perform Calibration window

11. If you are calibrating with a Spotmeter, foam on the Spotmeter, without tube!
12. Click **Continue.**
13. Wait about 5 minutes; the background color changes until the *Select LUT storage position* window appears.

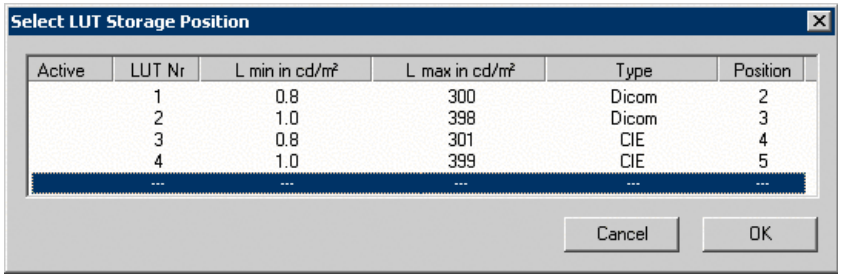

Fig. 10 Selecting LUT Storage Position

14. Select as LUT the last position entry and click “OK”.
15. Confirm the following message with “OK”.

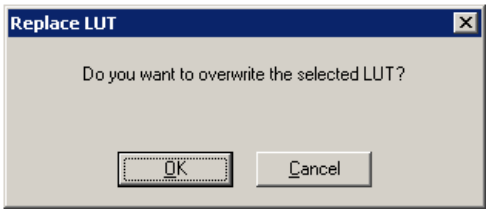

Fig. 11 Message: Overwriting LUT

Calibration Report Window (Spotmeter)

In the SMFit Act main menu, click **Reports**>**Calibration Report**.

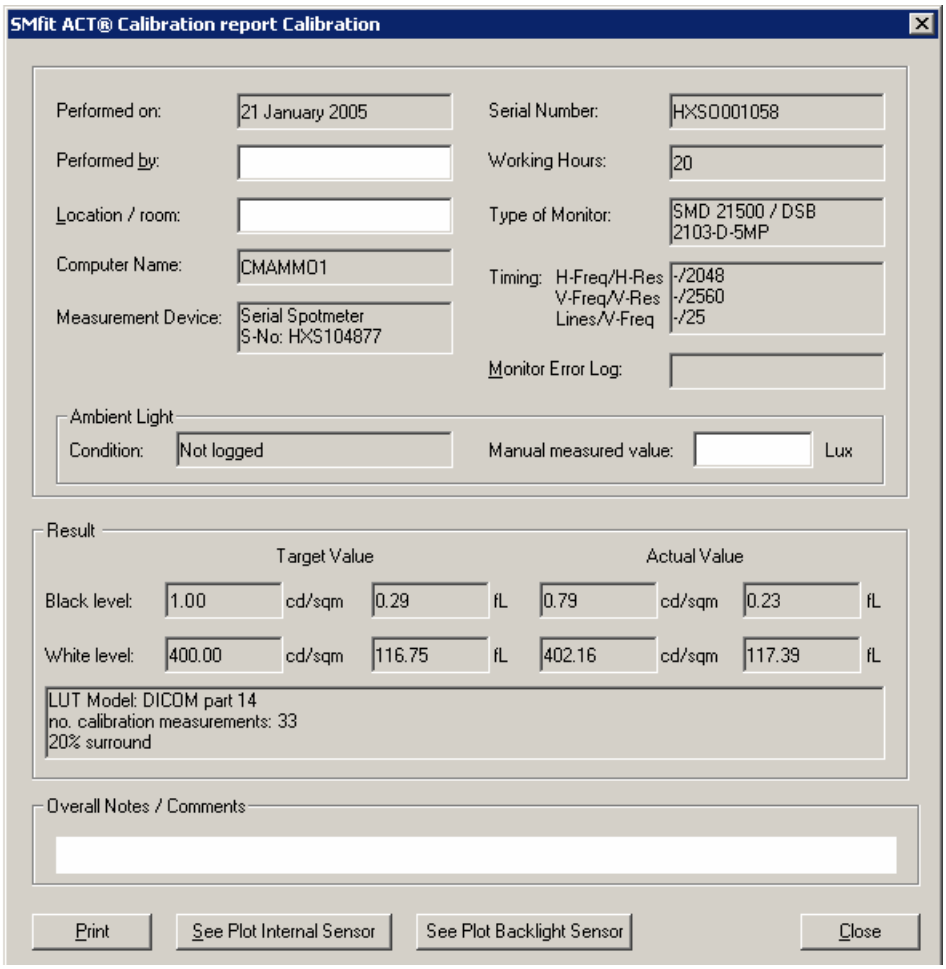

Fig. 12 Report Calibration window

Print the report or close the window.

Performing conformance test (Spotmeter)

In the main menu, click **Luminance Calibration**>**Conformance Test**. A dialog window is displayed. Click continue.

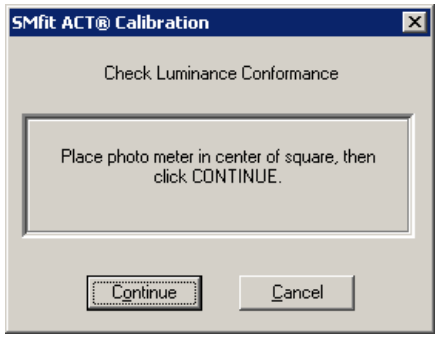

Fig. 13 Check Luminance Conformance

Calibration report Conformance test Window (Spotmeter)

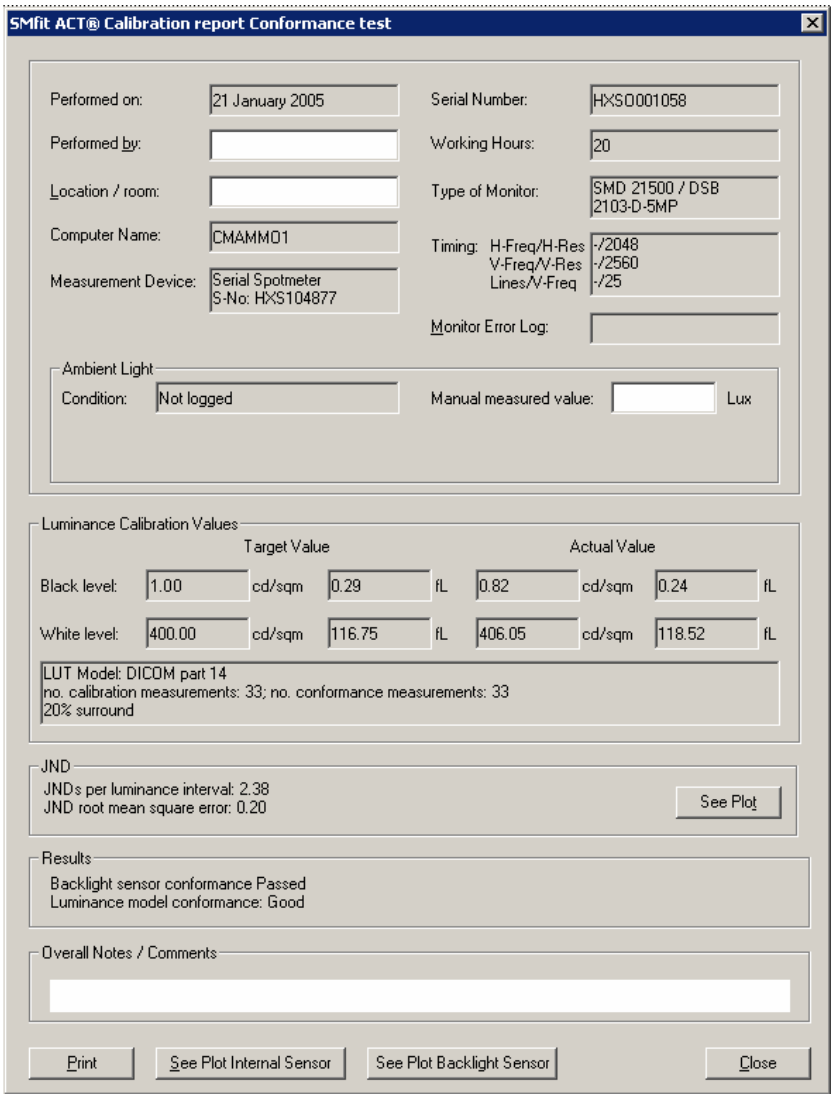

Fig. 14 Calibration report conformance test window

Print the report or close the window.

The calibration of first monitor is finished.

Calibration Report Window (Universal Serial Luminance Meter)

In the SMFit Act main menu, click **Reports**>**Calibration Report**.

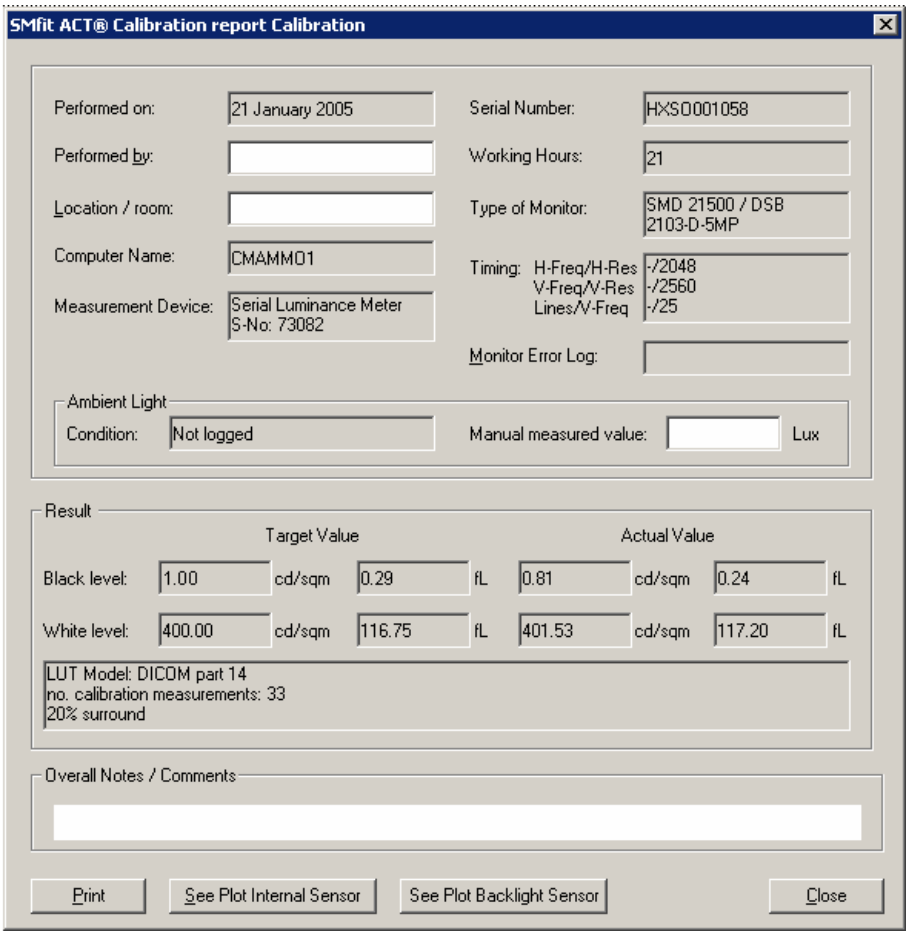

Fig. 15 Report Calibration window

Print the report or close the window.

Performing conformance test (Universal Serial Luminance Meter)

In the main menu, click **Luminance Calibration**>**Conformance Test**. A dialog window is displayed. Click continue.

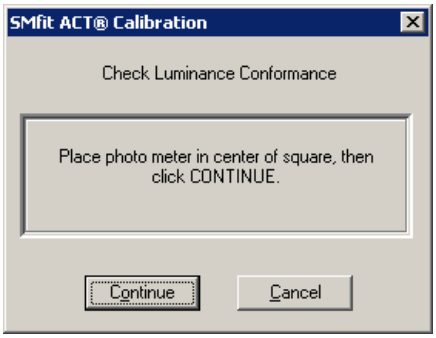

Fig. 16 Check Luminance Conformance

Calibration report Conformance test window (Universal Serial Luminance Meter)

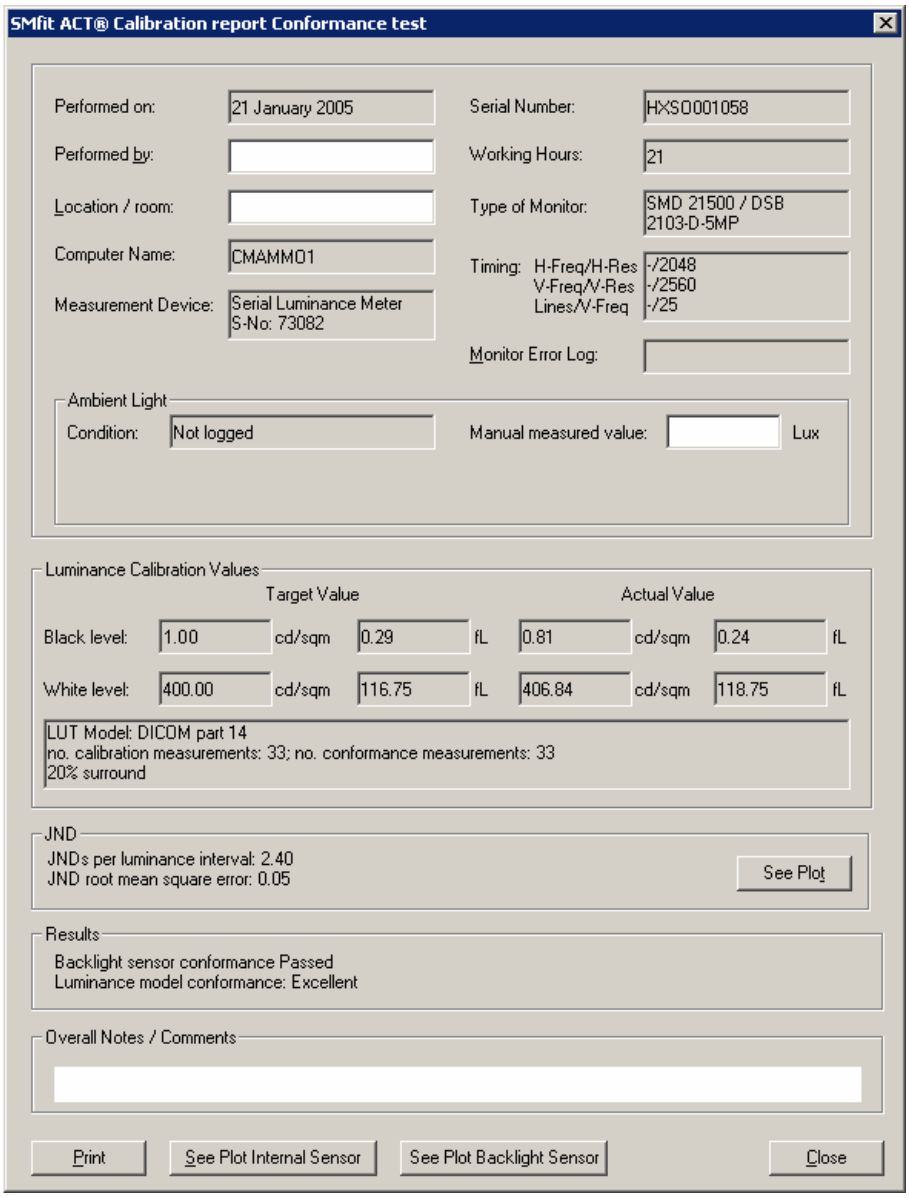

Fig. 17 Calibration report conformance test window

Print the report or close the window.

The calibration of first monitor is finished.

Calibration of Second Monitor

NOTE	**If the syngo monitor is active, the monitor numbers are Monitor 2 (right) and Monitor 3 (left).** **If the syngo monitor is turned off, the monitor numbers are Monitor 1 (right) and Monitor 2 (left).**

1. In the *Preferences* window, click menu for other high resolution monitor (Monitor 3 if syngo monitor is active, which is assumed below).

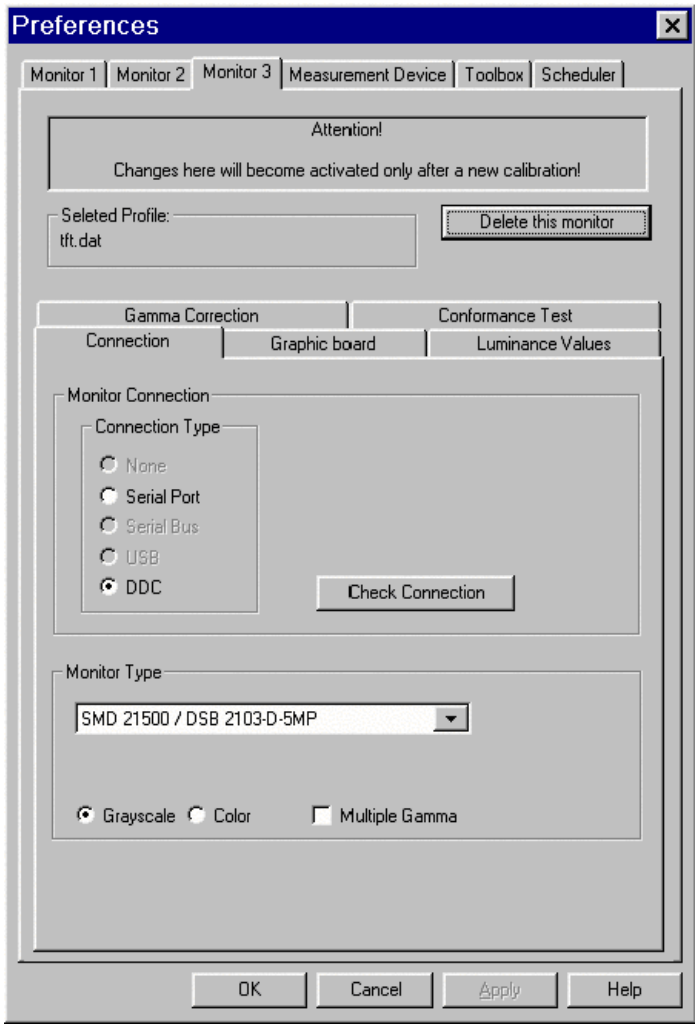

Fig. 18 Preferences of Monitor 3

Selecting Monitor 3

1. At the bottom of the window select Monitor 3.

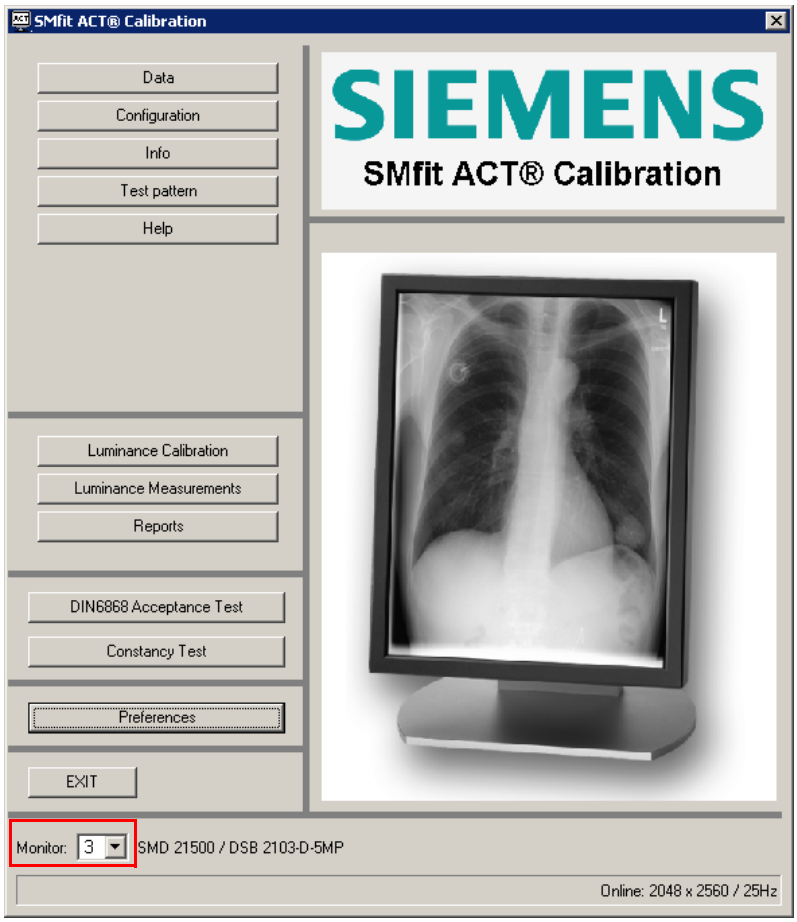

Fig. 19 SMfit ACT Main window

2. Repeat the calibration with Monitor 3, using the same values.

   Refer to section "Luminance Values" on Page 2 - 12.

3. Perform the following steps for the second monitor:
   - Luminance calibration
   - Report Calibration and Report Conformance Test
   (refer to Page 3 - 4, Page 3 - 9 and Page 3 - 10)

NOTE **The monitors delivered with the system always need to be calibrated during start-up at customer site according to the requirements that are described in the Quality Control Manual (Print-No: SPB7-420.621.20...).**

To perform a calibration of Barco Coronis Mammo Display Systems with Medical® Pro follow these steps:

1. Select Option / End Session / Shutdown to shutdown the system.
2. Turn on the computer and hold shift key pressed to login as administrator.

NOTE **MediCalPro Calibration Software has been pre-installed during installation at the factory.**

Starting up for the first time

1. If the system contains no Barco flat panel displays, MediCal Pro will notice that there is no configuration set up in the program yet. It will ask if you want to log in as Advanced user, to set up the configuration.

Fig. 1 Window: No configuration

2. Select **Yes**.

3. MediCal Pro opens the login window because you have to be advanced user to set up the configuration.
   Login as **meduser**. In the User Password box, enter “advanced”.

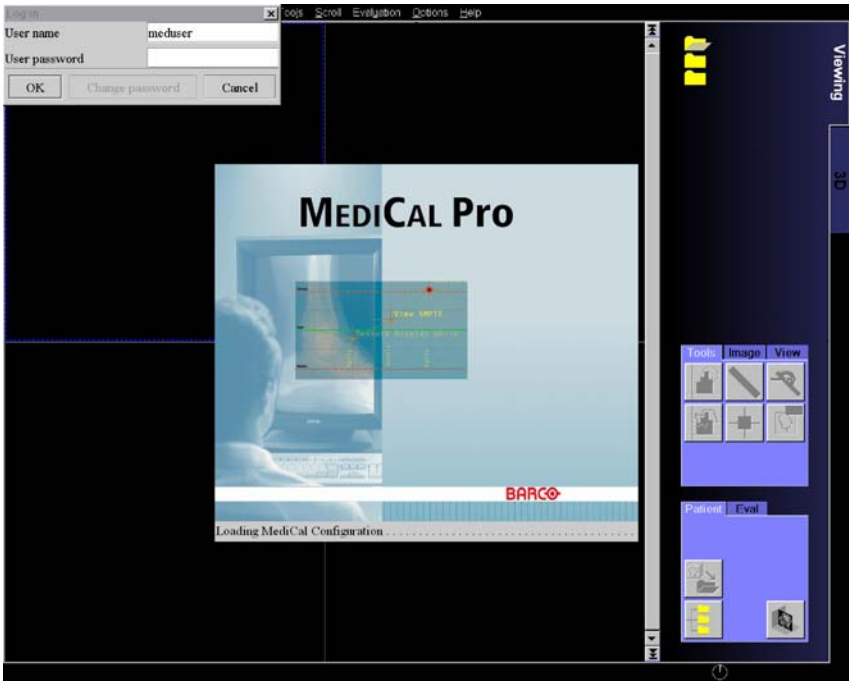

Fig. 2 MediCal Pro Login window

4. Select **OK**.
5. If the system contains Barco flat panel displays, the detected displays are given in a message box.

Fig. 3 Message: New display detected

6. Click **Add Now** to proceed and add the displays to the configuration.
   MediCal Pro asks whether or not you wish to connect to MediCal Administrator on the network.

Fig. 4 Message: MediCal Administator connection

7. Select **No** and continue.

8. You can perform a number of actions for the displays when they are listed in the Configuration section. Therefore, right-click on the icon of the display you want to perform an action for. A menu with possible actions will pop up.

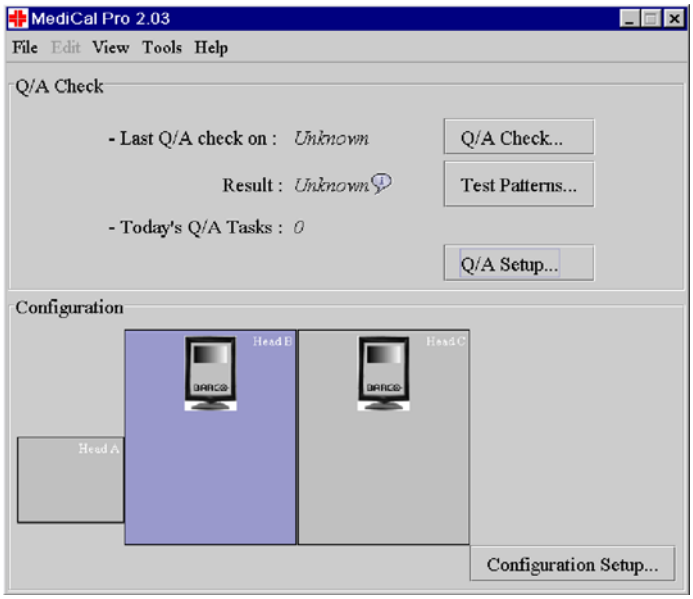

Fig. 5 MediCal Pro: Selecting Head B

9. Select **Head B**.
10. Select **Tools**>**Properties**>**Details** to view the display information.

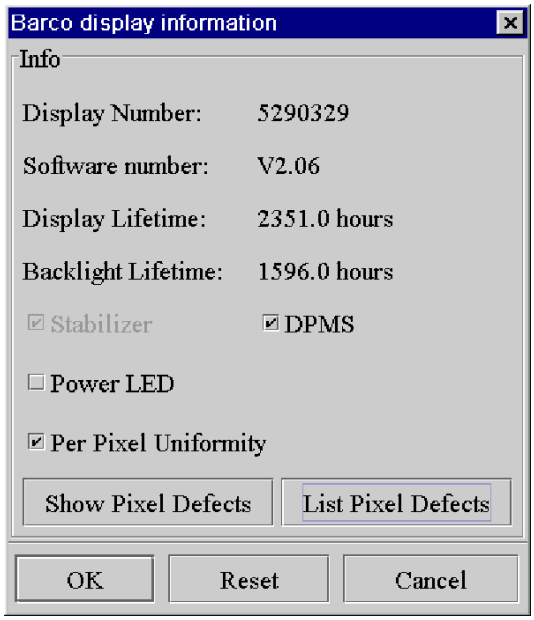

Fig. 6 Barco display information

11. Click **OK** to continue.

Calibrating Display Head B

NOTE	**The displays must be warmed up for at least 5 minutes before starting calibration.**

To start calibration:
Calibration starts automatically after defining a new, uncalibrated Preset or after modifying a Preset.

1. Select display **Head B**. Right-click on the icon of the display and select **Tools>Presets**.

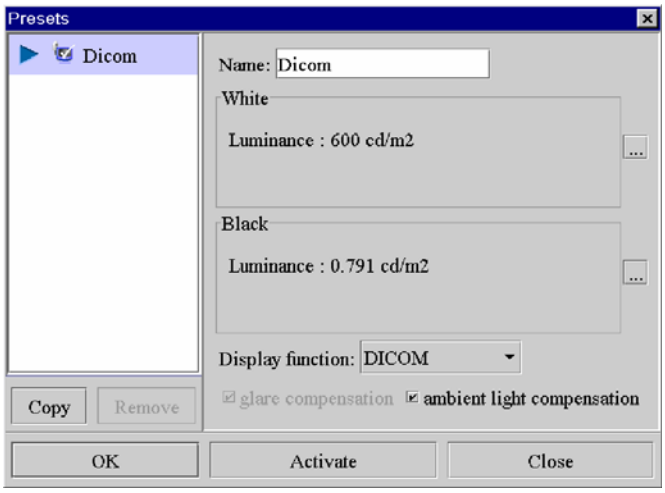

Fig. 7 Default Presets

2. Change the preset as follows:

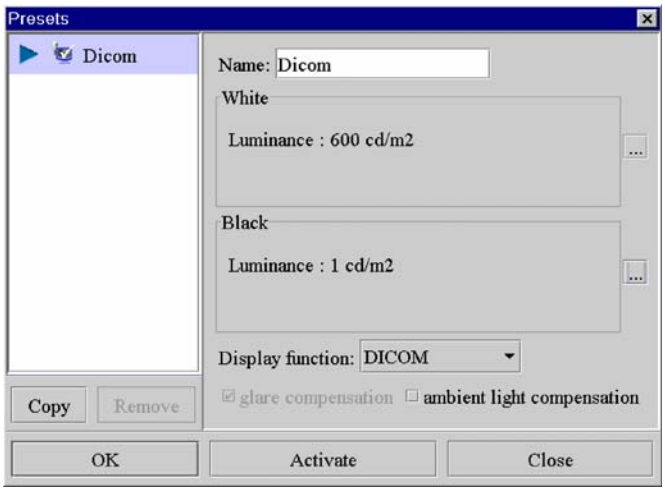

Fig. 8 Required presets for Head B

3. Click **OK**. After 3-5 minutes the following message displays:

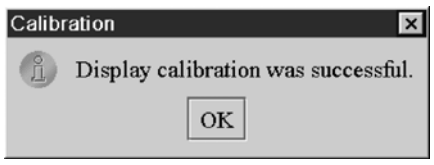

Fig. 9 Message: Successful calibration of Head B

Calibrating Display Head C

1. Select display **Head C**.

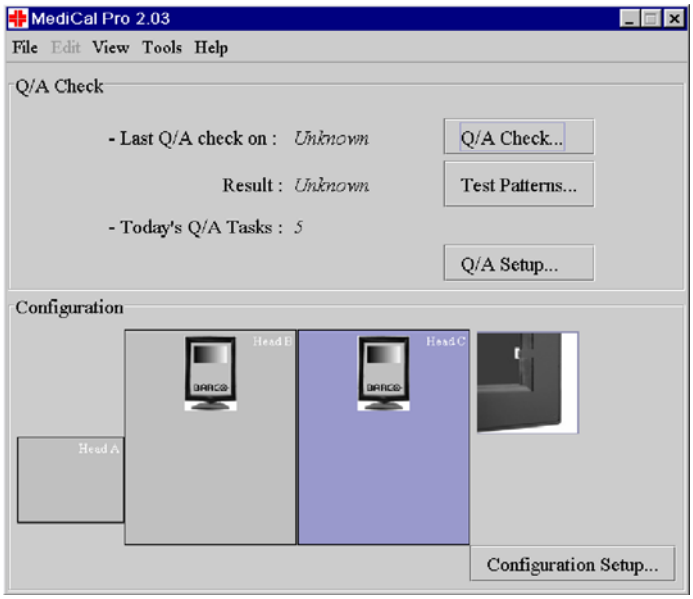

Fig. 10 MediCal Pro: Selecting Head C

2. Right-click on the icon of the display and select **Tools>Presets**.

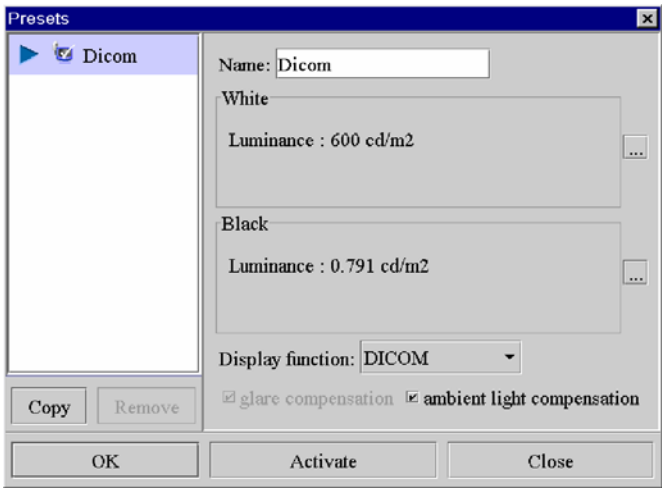

Fig. 11 Default Presets

3. Change the preset as follows:

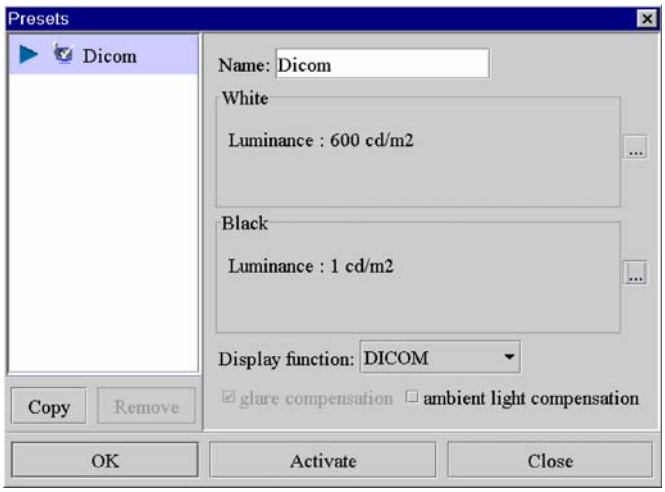

Fig. 12 Required presets for Head C

4. Click **OK**. After 3-5 minutes the following message displays:

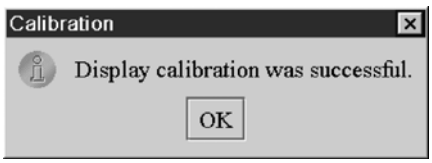

Fig. 13 Message: Successful calibration of Head B

Selecting Luminance Units

1. To select the luminance units, select **Tools**>**Options**>**Application Settings**.
2. Select the **General** tab.
3. Select the desired luminance unit.

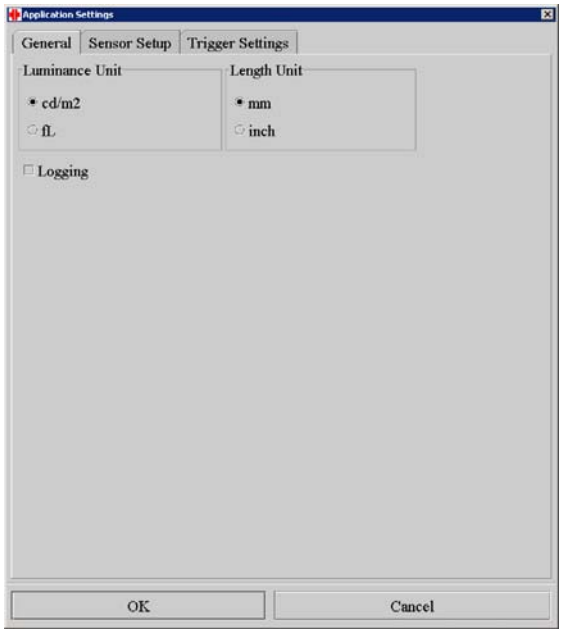

Fig. 14 Application Settings

4. Click **OK**.

Optional Quality Check

If external measurement devices are available, e.g. Minolta LS 100 or Wellhoefer LX, you can perform an optional quality check.

Setting up optical sensor list

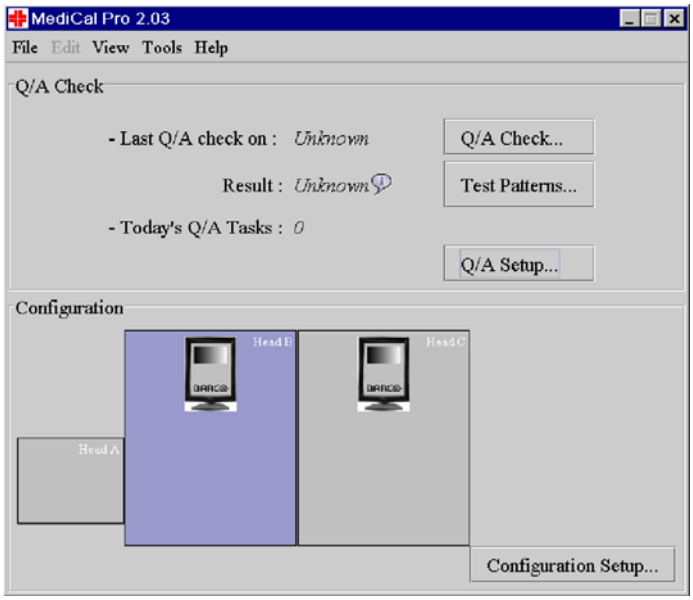

Fig. 15 MediCal Pro: Selecting Head B

1. From the **Tools** menu, select **Options>Application Settings**.
2. Select the **Sensor Setup** tab.

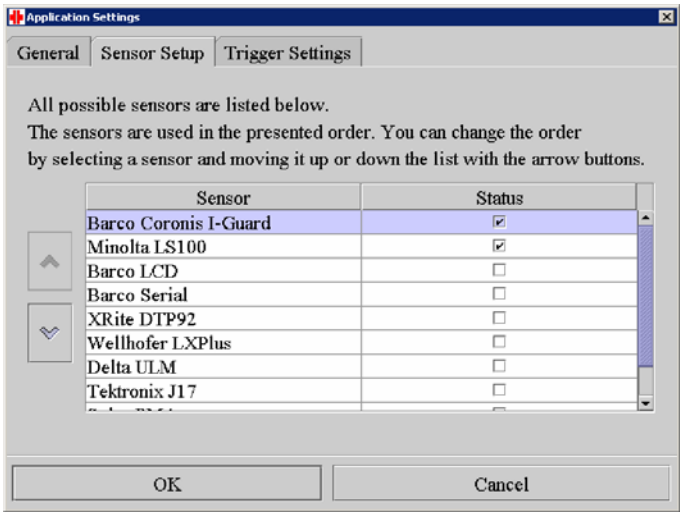

Fig. 16 Application Settings

3. Check the types of sensors used on the viewing station. Do not check the types that are not used.
4. Select e.g. Minolta LS100 and click **OK**.

5. Select **Test Patterns**.

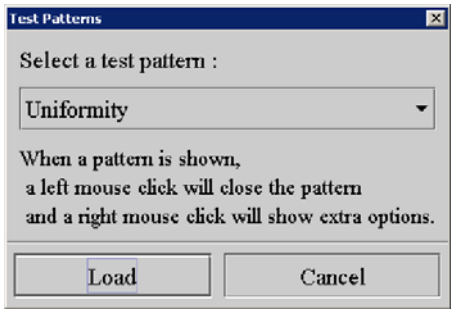

Fig. 17 Test Patterns

6. Click **Load**. Searching the connected sensor starts.

Fig. 18 Searching sensor

7. In the main window, click **Q/A Check** to start the check.

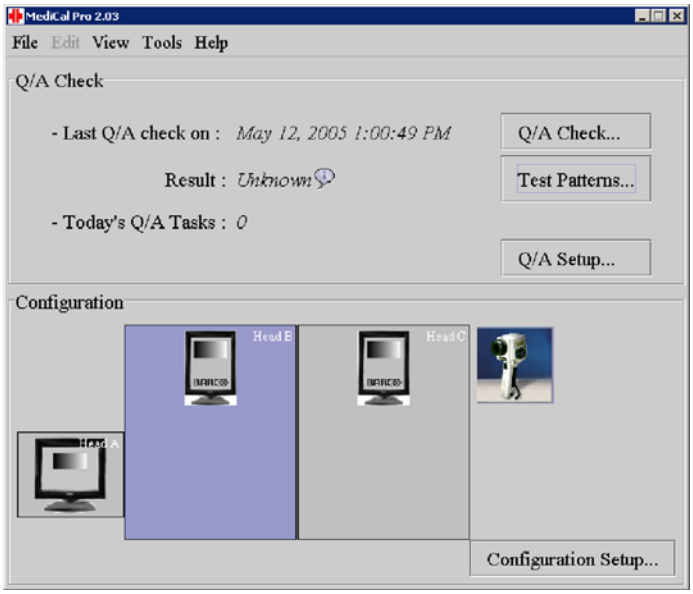

Fig. 19 MediCal Pro: Detected optical sensor

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NOTE **The monitors delivered with the system always need to be calibrated during start-up at customer site according to the requirements that are described in the Quality Control Manual (Print-No: SPB7-420.621.20...).**

To perform a calibration of Planar Dome Display Systems with CXtra follow these steps:

1. Select Option / End Session / Shutdown to shutdown the system.
2. Turn on the computer and hold shift key pressed to login as administrator.

NOTE **Cxtra Calibration Software has been pre-installed during installation at the factory.**

Starting up for the first time

1. Select **Cxtra icon** from the taskbar.

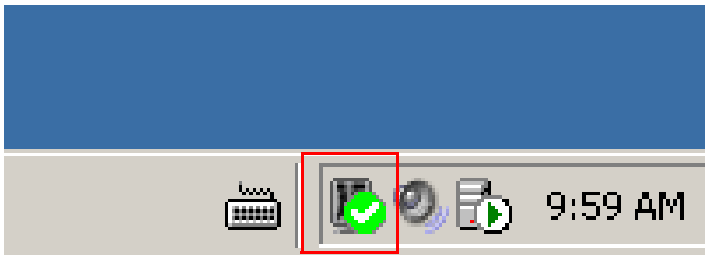

Fig. 1 Cxtra Taskbar Icon

2. Then click on icon and select **Privileged user**.
3. Select **Start as privileged user**.

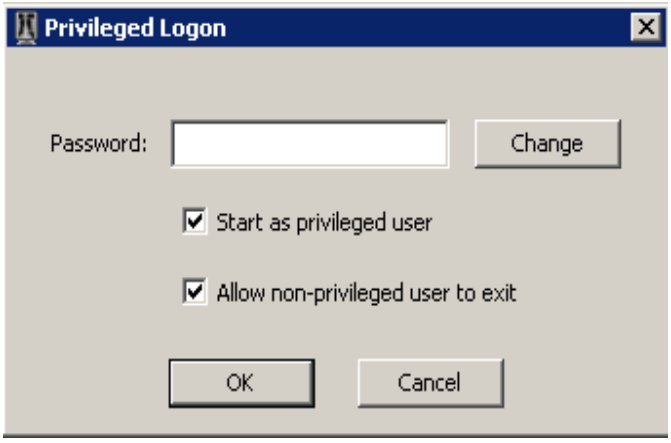

Fig. 2 Cxtra Privileged Logon

4. Type **cxtra** as password and verify that checkbox *Start as privileged User* is checked.
5. Click **OK** to confirm.

Panel Configuration

1. Open Cxtra again by clicking on taskbar icon and in the menu select **RightLight Panel Configuration** to open the configuration window.
2. On the left side check that both display checkboxes are checked.
3. On the **Backlight** tab check that default settings are set as follows:
   - in Target Luminance: White level to **450 cd**
   - In Dynamic Range: **Equalize**

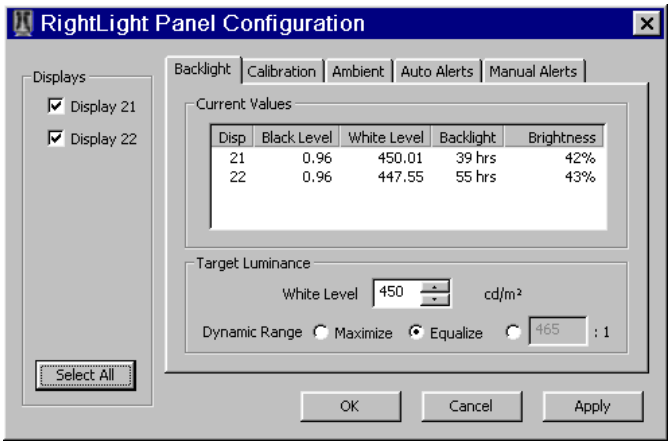

Fig. 3 Cxtra Right Light Panel Configuration: Backlight

4. **Select All** displays. Enter in Target Luminance the **White Level** value **450 cd/m** and select option **Equalize** for Dynamic Range.
5. Click **Apply** - wait for settings to be applied.
6. Select tab **Calibration** and check that the settings are configured as below - click **Apply** in case of any changes.

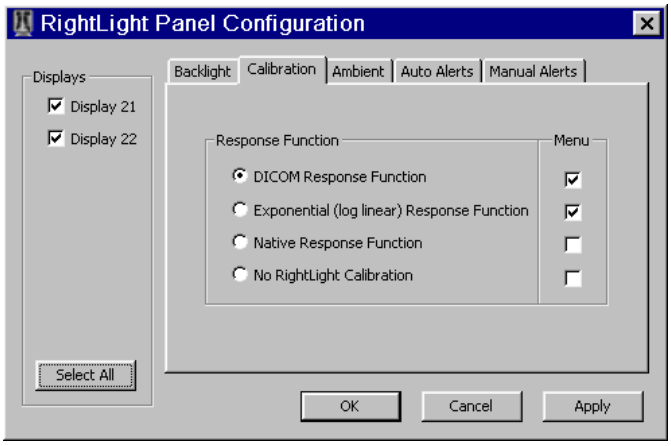

Fig. 4 Cxtra Right Light Panel Configuration: Calibration

7. On tab **Ambient** select Ambient Light **Low ...**- click **Apply** to save.

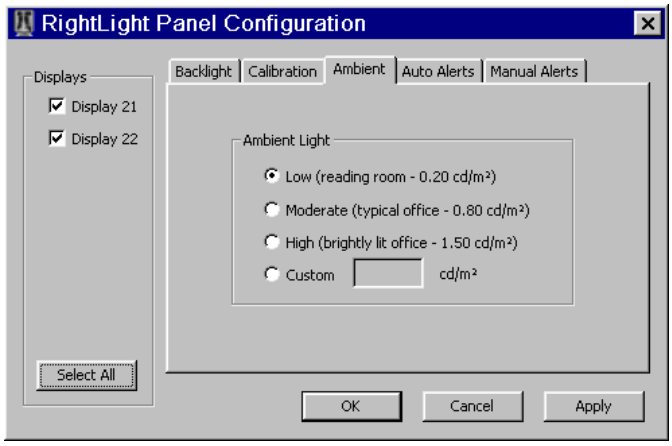

Fig. 5 Cxtra Right Light Panel Configuration: Ambient

8. Select tab **Auto Alerts** and check that the settings are configured as below - click **Apply** in case of any changes.

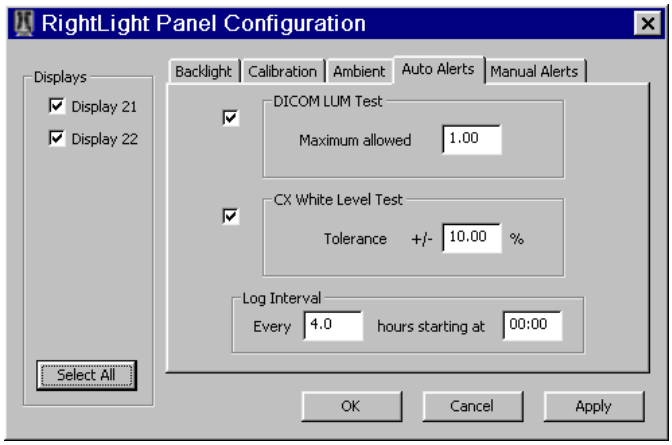

Fig. 6 Cxtra Right Light Panel Configuration: Auto Alerts

9. On tab **Manual Alerts** enter in **Number of measurements** value "**33**" and check that the settings are as shown in the figure below.

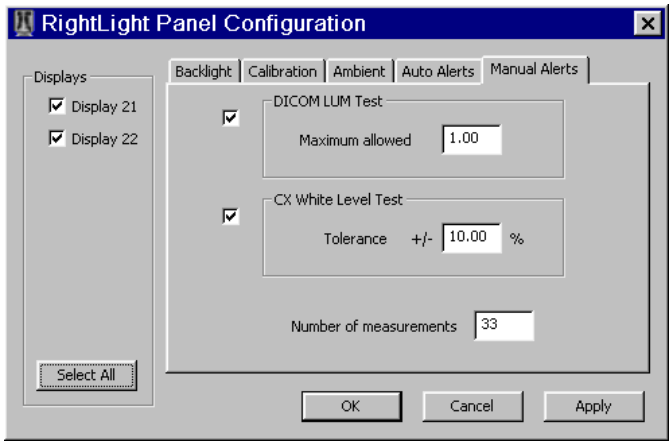

Fig. 7 Cxtra Right Light Panel Configuration: Manual Alerts

10. Click **OK** to save all changes - the dialog is closed.
11. Open **Cxtra** again by clicking on taskbar icon and select **Reporting Control**.

Fig. 8 Cxtra Reporting Control

12. Check **Disable RighLight popups** and click **OK**.

The calibration for the Planar TFT displays is automatically performed online according to adjusted values using the internal sensor.

Chapter	Page	Change
		initial version

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